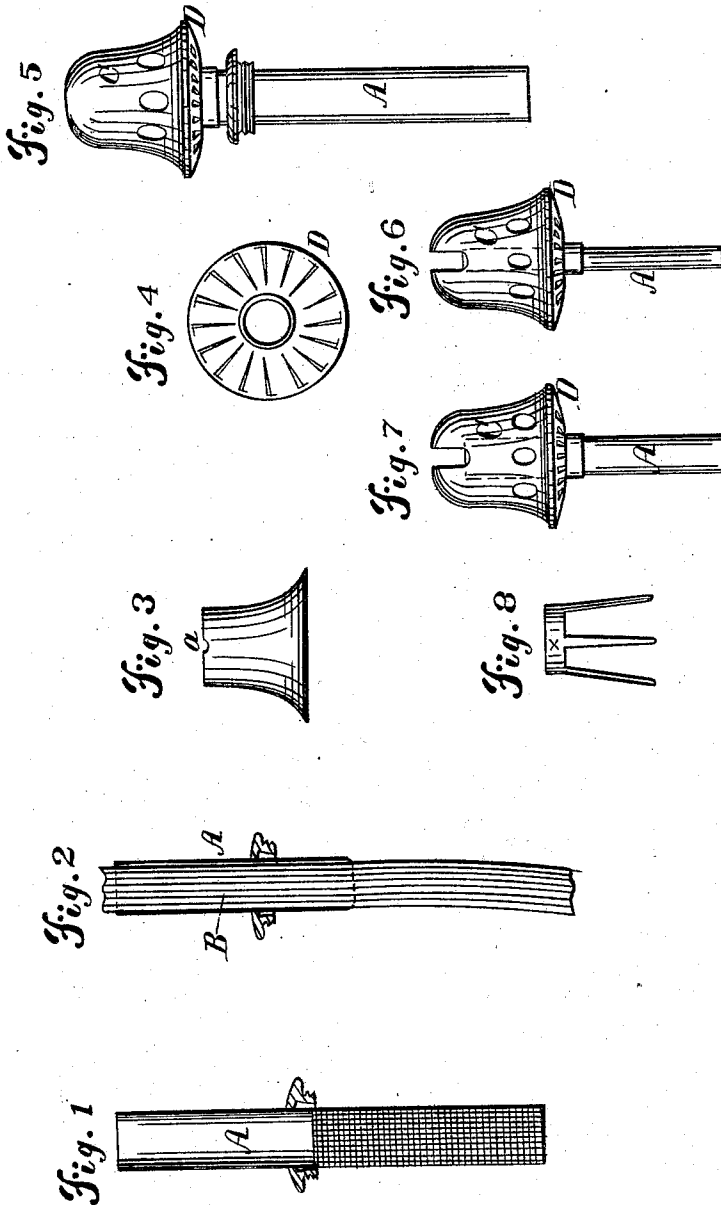


J. E. AMBROSE.

Vapor Burner.

No. 93,661.

Patented Aug. 17, 1869.



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JOSHUA E. AMBROSE, OF LOMBARD, ILLINOIS.

Letters Patent No. 93,661, dated August 17, 1869.

IMPROVEMENT IN VAPOR-BURNERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOSHUA E. AMBROSE, of Lombard, Du Page county, Illinois, have invented, made, and applied to use, certain new and useful Improvements in the Construction of Hydrocarbon-Burners; and I do declare the following to be a full, clear, and correct description of my invention, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a view of one form of packing-tube used by me.

Figure 2 is a view of a round tube.

Figure 3 is a view of the inner tube used by me.

Figure 4 is a bottom view of the bottom employed by me.

Figures 5, 6, and 7, are views, showing the deflector combined with various styles of packing-tubes.

Figure 8 is a sectional view of a second form of tube used by me.

In the drawings, like parts of the invention are pointed out by the same letters of reference.

The nature of the present invention consists in certain improvements in the construction of hydrocarbon-burners, as more fully hereinafter set forth; the object of the present invention being the production of a hydrocarbon-burner at low cost, which, at the same time, produces a clear and bright flame, and one free from smoke.

To enable those skilled in the arts to make and use my invention, I will describe the construction and operation of the same.

A, in the drawings, shows the packing-tube employed by me. This packing-tube differs essentially from the wick-tubes usually employed, in that it is not provided with a ratchet-wheel, or wheels and lever to operate the same, but is formed either in an oblong or round form, as shown in figs. 1 and 2 of the drawings.

This packing-tube may be made long enough to extend to the bottom of the lamp, as shown in fig. 5, or may extend only part way, as shown in figs. 1 and 2 of the drawings.

When made as in fig. 1, the portions of the tube below the button may be made of wire gauze, and when made as in fig. 2, the metal extends below the button, and has its lower edge closed around an ordinary lamp-wick, or any good feeder, which in this case is intended to supply the fluid from the lamp-fountain to the packing contained in tube.

This packing B may be composed of cotton-waste, cotton, pieces of cotton-flannel, or any good porous substance, the packing, in the case of tubes made as in fig. 2, extending from the bottom to the top of the tube, and in the case of a tube made as in figs. 1 and 5, the packing filling the tube the entire length.

In some cases the packing-tube is made of the same

area as the slot in the deflector employed, (see fig. 6,) and in other cases this tube may be made of greater area (see fig. 7) than the slot in the deflector.

In some cases the packing-tube is made with its upper corners round, square, or oval.

C shows the deflector made in the ordinary manner, and supported upon a concave bottom, D, and openings, similar to those shown in the concave bottom, may be made in the sides of this deflector.

The metal in this bottom D, after an opening has been punched in the same, is turned down about its centre, so as to form a flange, which fits tightly upon the tube when the bottom is passed over it.

In making this bottom D, the metal upon the under side is raised, so as to form a series of apertures for the admission of air. The raised portions of the metal are twisted, at one end outward, at the other end inward, so that the edges of the raised portions of the metal stand angularly, or the forward ends of the raised portions may be bent into a vertical position if desired.

The inner tube is provided with the slots *d d*, as shown in the drawings.

Such being the construction, the operation may be thus set forth:

The tube, if made as shown in figs. 1 and 5, is to be packed, as already stated, with cotton-waste, cotton, pieces of cotton-flannel, or any good porous substance, and if made as shown in fig. 2, the packing is made to extend from the top of the wick or packing-tube to the button upon the same, or a short distance below it, while the portion of the tube is fitted with ordinary lamp-wick, or any good feeder of oil, extending down into the lamp, and intended to supply the packing with oil. The tube may then be inserted into the lamp or lantern, and the deflector and tube, constructed as shown, being placed over the same, the packing in the packing-tube may be lighted as in the case of the ordinary lamp.

In fig. 8, of the drawing, is a view of a tube which I sometimes employ instead of the tube proper, as shown in fig. 3. This consists simply of a ring of metal, X, provided with the legs *x*, forming a continuation of the metal from which the ring is made. This may be passed over the packing-tube, and attached to the concave bottom, or to the deflector in any convenient manner.

It will be observed that in the present invention a packing-tube, made without a ratchet-wheel or wheels, and in which a packing is employed, is substituted for the present wick-tube.

By thus constructing the packing-tube, and packing the same, several advantages are arrived at, among which may be mentioned a decrease in the cost of manufacture, less liability to get out of order or to explode, and when used with the deflector constructed as shown, a far brighter flame is produced.

In other lamps a chimney is necessarily employed, to produce a perfect combustion; in my burner, none is necessary.

I have stated heretofore that the tube may be made with round, square, or oval corners, but in either case the distance from one side of the tube to the other is about equal to the width of the slot crosswise in the deflector, or may be made greater, as shown in fig. 7.

When the area of the mouth of the tube is greater than the area of the slot in the deflector, a more perfect combustion results than when the area of the mouth of the tube and of the slot be equal, inasmuch as the currents of heated air, as they rush upward, are checked in their upward motion by striking the under side of the deflector, and are prevented from passing out through the slot of the deflector, and thus a large quantity of air is brought directly to the base of the flame, thus greatly aiding the combustion.

By my improvement, also, I secure a large base of packing for the flame to act upon, and a large amount of oil is on fire, while the packing does not extend above the top of the tube to cause smoke, and this, connected with the fact that so large a flame is at the same time burning beneath the deflector, making new gas, produces steadiness and tenacity of flame and perfect combustion.

The bottom supporting the deflector is made as already described, that the strips of metal may act as heaters, and serve to heat the air as it enters the openings in the same, causing it to ascend more rapidly, and giving to the flame a full supply of atmosphere.

The tube, fig. 3, is provided, as already stated, with the slots *d d*, one upon each side, for the purpose of spreading the air carried up by the tube before it strikes the base of the flame, thus securing a steady flame by preventing the flickering of the flame so common.

This tube, which rests upon the concave bottom also, and is placed within the deflector, is intended to convey currents of heated air to the base of the flame, combining them with the carbon, and rendering the combustion more perfect.

Another portion of the air passes up between the deflector and the tube, uniting with the flame above the tube before it passes through the slot in the deflector.

The currents of air are admitted into the tube and the deflector through openings in the bottom, upon which the tube and the deflector rest, and through openings in the deflector, near its base, air is also admitted, making two currents of air, one of which unites with the flame at its base, and the other above the base.

The deflector, concave bottom, and tube, are so constructed that they can be elevated or lowered upon the

packing-tube, thus allowing the flame to be decreased or increased, as desired.

When the deflector and tube are elevated, the flame, confined, as it will be, in a small space, will be decreased, and *vice versa*.

When a tube constructed as shown in fig. 8 is used, it will be found that a portion of air will be brought to the base of the flame, that the same acts as a shield to the packing-tube, the flame burning above the tube, and that the flame can be increased or diminished, as desired, as already described in the case of the tube constructed as shown in fig. 3.

The slot in the deflector may be made of any width and length, according to the character of the flame desired, and in order that the oil may not run over the mouth of the packing-tube, a small air-hole should be made in the bottom, as shown in fig. 1 of the drawings.

In conclusion, it will be observed that the following advantages result from the use of my invention, in addition to those already enumerated:

First, I obtain a flame free from odor. This is uncommon in "no-chimney" burners, except where artificial means are used to effect this purpose.

Second, the shape of the flame, particularly that produced by the use of a round tube, (see fig. 2,) adapts the burner to the smallest-size lanterns.

Third, I dispense with the snuffing of the wick, and all the difficulties and expense connected with their use in lamps.

Fourth, I obtain a taller and purer flame without smoke than heretofore obtained, and one so steady that it as readily resists currents of air as the flame of a lard-oil lamp.

Fifth, when a round tube is employed, which is preferable where the burner is to be used in connection with a lantern, the tube or deflector, if applied to the same, will readily, no matter how placed upon the tube, adapt itself to the tube, and, as already stated, can be lowered or elevated upon the same, thus governing the extent of the flame produced.

Having thus described my improvement,

What I claim as new, and desire to secure by Letters Patent, is—

1. Combining with the deflector and packing-tube, the inner tube, provided with the notches, as and for the purposes set forth.

2. The combination of the tube, constructed as shown in fig. 2, with a deflector, provided with a bottom, D, arranged as shown and specified, for the purposes set forth.

Witnesses:

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GEO. W. ALLEN.